

A leaf like that shown in fig. 4 is certainly most unlike the one shown in fig. 20, but the transition between the two is perfect. Nearly all the leaf-forms occur at Wilmington, and at each station as the plant goes up our coast, where it seems to be confined to the tidal mud of river-estuaries, the extreme form tends to be less hastate but more subulate.

Lophotocarpus spongiosus, then, grades into *L. calycinus* where the ranges of the two are coincident, but at the parts of its range more remote from *L. calycinus* it shows well-marked extremes. It seems therefore to be better treated as a variety, just as Engelmann first described it, but under *Lophotocarpus* it becomes

L. CALYCINUS (Engelm.) J. G. Smith, var. **spongiosus** (Engelm.) n. comb. *Sagittaria calycina* var. *spongiosa* Engelm., Gray's Manual ed. 5, 493 (1867). *Lophotocarpus calycinus* J. G. Smith, Mem. Torr. Bot. Club, v. 25 (1894). *L. spongiosus* (Engelm.) J. G. Smith, Rev. of the Spec. of Loph. of the U. S., 4. (1899) and Rep. Mo. Bot. Gard., xi. 148 (1900). *L. spatulatus* J. G. Smith, Rev. of the Spec. of Loph. of the U. S., 5 (1899) and Rep. Mo. Bot. Gard., xi. 148 (1900). *Lophiocarpus calycinus* Micheli, DC. Monog. Phan. iii. 61 (1881).

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EXPLANATION OF PLATE 137.

Figures 1-3. *Lophotocarpus calycinus* $\times \frac{1}{3}$.

Figures 4-23. *Lophotocarpus calycinus*, var. *spongiosus* $\times \frac{1}{3}$.

VARIATIONS OF *CAREX ANNECTENS*.

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WHILE collecting in a field in which *Carex vulpinoidea* and *C. annectens* were very abundant, the writer was troubled by a third form that, though less abundant than either of the others, was represented by many fine clumps. An inspection of the manuals gave no help, and the problem was later taken up for study at the Gray Herbarium. It was possible to separate the material into two rather well marked, though somewhat intergrading strains, which accorded well with the observations in the field. On looking through the literature it was soon found that these two forms of *C. annectens* had already been distinguished by Bicknell in 1896. The two plants should be treated as follows:

C. ANNECTENS Bicknell, Bull. Torr. Bot. Club, xxxv. 492 (1908).
C. xanthocarpa annectens Bickn. Bull. Torr. Club, xxiii. 23 (1896).
C. vulpinoidea, var. *ambigua* Barratt, Suppl. N. A. Carices, no. 62 (1841), and in Boott's Ill. Carex, iii. 125. t. 406 (1862). *C. setacea*, var. *ambigua* Fernald, RHODORA, viii. 167 (1906).—Inflorescence greenish-stramineous becoming deep brown in age, oval-oblong or more generally linear-oblong; perigynia 2.6–3.2 mm. long, almost always nerved on the outer face; beak rather prominent, broad, serrulate, usually plainly notched. Central Maine along the coast to the District of Columbia (North Carolina, according to Bicknell), and less frequent westward to central New York.

Var. **xanthocarpa** (Bicknell) n. comb. *C. xanthocarpa* Bicknell, Bull. Torr. Bot. Club, xxiii. 22 (1896), not Degland in Loiseleur, Fl. Gall. ii. 299 (1807). *C. vulpinoidea*, var. *xanthocarpa* Kükenthal, Pflanzenreich, IV. xx. 148 (1909).—Inflorescence usually golden-brown, averaging shorter and thicker than in the typical form; spikes less echinate because of the shorter beaks; perigynia smaller, 2.2–2.6 mm. long, the wall thicker and essentially nerveless; beak very short, narrower, usually less serrulate, and more obscurely notched.—Western New Hampshire and central Connecticut to Virginia, westward through New York and Ohio to Illinois, Iowa and Missouri. The writer has seen no specimens from so far east as Cambridge, Mass. (*E. Tuckerman*) as cited by Bicknell. Specimens examined were as follows: VERMONT: Lake Dunmore, 1901, *E. Brainerd*. MASSACHUSETTS: Allen Street, Springfield, 1878, *L. Andrews*. CONNECTICUT: Hartford, 1878, *C. Wright*; Southington, 1901, *C. H. Bissell*. NEW YORK: near Albany, 1918, *H. D. House*; near Utica, *C. Dewey*; near Slaterville swamp, Caroline, *Eames, Randolph & Wiegand*, no. 11,566. DELAWARE: Wilmington, *Canby*. VIRGINIA: Bluemont, *H. D. House*, nos. 876 & 878. OHIO: *Sullivant*; Oxford, *E. L. Moseley*, no. 7253. ILLINOIS: Marion County, *Bebb*; Decatur, *I. W. Clokey*; Wadra Petra, *V. H. Chase* as *Kneuker*, no. 366; Joliet, *Wheeler & Steele*, no. 283. IOWA: Fort Dodge, *M. P. Somes*; Peru, *D. E. Hollingsworth*, no. 392. MISSOURI: Lee's Summit, *B. F. Bush*, no. 3941; Buckner, *Bush*, no. 6793; Grain Valley, *Bush*, no. 93, in part.

The nervation and size of the perigynia go fairly well together. Only one or two specimens were seen with the large fruit and no nerves on the outer face, while there were two or three only with the short measurements and nerves present.

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